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WITHDRAWN - Testing the feasibility of a solid-state system for a T-violation search experiment

A new source of time-reversal symmetry violation (T-violation) is widely believed to be necessary to explain the matter-antimatter asymmetry of the universe. Searches for the existence of permanent electric dipole moments (EDMs) of atomic nuclei can probe new physics sources of T-violation at energy scales that are vastly beyond the reach of colliders. We are evaluating the feasibility of using a solid-state system (Tm:YAG) to search for a permanent electric dipole moment of the ^{169}Tm nucleus. This system is particularly interesting as the nuclear spin can be optically manipulated and detected, which could lead to an EDM search experiment with greatly improved sensitivity to T-violation effects. We report on our studies of ^{169}Tm nuclear spin polarization, and detection of spin precession, using an optical transition in a Tm:YAG crystal.

Author: SAWAOKA, Hiromitsu (Department of Physics, University of Toronto)

Co-author: Dr VUTHA, Amar (University of Toronto)

Presenter: SAWAOKA, Hiromitsu (Department of Physics, University of Toronto)

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